

OIRP

CRF Processing Date: 7/19/2001

Edited by:

Verified by:

(STIC staff)

Serial Number:

09/877,476

ENTERED

☐

Changed a file from non-ASCII to ASCII

☐

Changed the margins in cases where the sequence text was "wrapped" down to the next line.

☐

Edited a format error in the Current Application Data section, specifically:

☐

Edited the Current Application Data section with the actual current number. The number inputted by the applicant was ☐ the prior application data; or ☐ other

☐

Added the mandatory heading and subheadings for "Current Application Data".

☐

Edited the "Number of Sequences" field. The applicant spelled out a number instead of using an integer.

☐

Changed the spelling of a mandatory field (the headings or subheadings), specifically:

☐

Corrected the SEQ ID NO when obviously incorrect. The sequence numbers that were edited were:

☐

Inserted or corrected a nucleic number at the end of a nucleic line. SEQ ID NO's edited:

☐

Corrected subheading placement. All responses must be on the same line as each subheading. If the applicant placed a response below the subheading, this was moved to its appropriate place.

☐

Inserted colons after headings/subheadings. Headings edited included:

☐

Deleted extra, invalid, headings used by an applicant, specifically:

☐

Deleted: ☐ non-ASCII "garbage" at the beginning/end of files; ☐ secretary initials/filename at end of file; ☐ page numbers throughout text; ☐ other invalid text, such as

☐

Inserted mandatory headings, specifically:

☐

Corrected an obvious error in the response, specifically:

☐

Edited identifiers where upper case is used but lower case is required, or vice versa.

☐

Corrected an error in the Number of Sequences field, specifically:

☐

A "Hard Page Break" code was inserted by the applicant. All occurrences had to be deleted.

☐

Deleted *ending* stop codon in amino acid sequences and adjusted the "(A)Length:" field accordingly (error due to a PatentIn bug). Sequences corrected:

☒

Other:

Page 19-20, 22 - mixed (2233) reverse up one line

*Examiner: The above corrections must be communicated to the applicant in the first Office Action. DO NOT send a copy of this form.

3/1/95

RAW SEQUENCE LISTING

DATE: 07/19/2001

PATENT APPLICATION: US/09/877,476

TIME: 12:52:07

Input Set : A:\PTO.txt

Output Set: N:\CRF3\07192001\I877476.raw

4 <110> APPLICANT: Jaworski, Jan G.
5 Blacklock, Brenda J.
7 <120> TITLE OF INVENTION: FATTY ACID ELONGASE 3-KETOACYL COA
8 SYNTHASE POLYPEPTIDES
10 <130> FILE REFERENCE: 07148-108001
C--> 12 <140> CURRENT APPLICATION NUMBER: US/09/877,476
C--> 12 <141> CURRENT FILING DATE: 2001-06-08
12 <150> PRIOR APPLICATION NUMBER: US 60/210,326
13 <151> PRIOR FILING DATE: 2000-06-08
15 <160> NUMBER OF SEQ ID NOS: 56
17 <170> SOFTWARE: FastSEQ for Windows Version 4.0
19 <210> SEQ ID NO: 1
20 <211> LENGTH: 1709
21 <212> TYPE: DNA
22 <213> ORGANISM: Arabidopsis thaliana
24 <220> FEATURE:
25 <221> NAME/KEY: CDS
26 <222> LOCATION: (1)...(1518)
28 <400> SEQUENCE: 1

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30	Met	Thr	Ser	Val	Asn	Val	Lys	Leu	Leu	Tyr	Arg	Tyr	Val	Leu	Thr	Asn	
31	1			5						10				15			
33	ttt	ttc	aac	ctc	tgt	ttg	ttc	ccg	tta	acg	gcg	ttc	ctc	gcc	gga	aaa	96
34	Phe	Phe	Asn	Leu	Cys	Leu	Phe	Pro	Leu	Thr	Ala	Phe	Leu	Ala	Gly	Lys	
35				20				25					30				
37	gcc	tct	cgg	ctt	acc	ata	aac	gat	ctc	cac	aac	ttc	ctt	tcc	tat	ctc	144
38	Ala	Ser	Arg	Leu	Thr	Ile	Asn	Asp	Leu	His	Asn	Phe	Leu	Ser	Tyr	Leu	
39				35				40					45				
41	caa	cac	aac	ctt	ata	aca	gta	act	tta	ctc	ttt	gct	ttc	act	ggt	ttc	192
42	Gln	His	Asn	Leu	Ile	Thr	Val	Thr	Leu	Leu	Phe	Ala	Phe	Thr	Val	Phe	
43				50				55				60					
45	ggt	ttg	ggt	ctc	tac	atc	gta	acc	cga	ccc	aat	ccg	ggt	tat	ctc	ggt	240
46	Gly	Leu	Val	Leu	Tyr	Ile	Val	Thr	Arg	Pro	Asn	Pro	Val	Tyr	Leu	Val	
47	65					70				75				80			
49	gac	tac	tcg	tgt	tac	ctt	cca	cca	ccg	cat	ctc	aaa	ggt	agt	gtc	tct	288
50	Asp	Tyr	Ser	Cys	Tyr	Leu	Pro	Pro	Pro	His	Leu	Lys	Val	Ser	Val	Ser	
51				85						90				95			
53	aaa	gtc	atg	gat	att	ttc	tac	caa	ata	aga	aaa	gct	gat	act	tct	tca	336
54	Lys	Val	Met	Asp	Ile	Phe	Tyr	Gln	Ile	Arg	Lys	Ala	Asp	Thr	Ser	Ser	
55				100				105					110				
57	cgg	aac	gtg	gca	tgt	gat	gat	ccg	tcc	tcg	ctc	gat	ttc	ctg	agg	aag	384
58	Arg	Asn	Val	Ala	Cys	Asp	Asp	Pro	Ser	Ser	Leu	Asp	Phe	Leu	Arg	Lys	
59				115				120					125				
61	att	caa	gag	cgt	tca	ggt	cta	ggt	gat	gag	acg	tac	agt	cct	gag	gga	432
62	Ile	Gln	Glu	Arg	Ser	Gly	Leu	Gly	Asp	Glu	Thr	Tyr	Ser	Pro	Glu	Gly	
63				130				135					140				
65	ctc	att	cac	gta	cca	ccg	cgg	aag	act	ttt	gca	gcg	tca	cgt	gaa	gag	480

RAW SEQUENCE LISTING

DATE: 07/19/2001

PATENT APPLICATION: US/09/877,476

TIME: 12:52:07

Input Set : A:\PTO.txt

Output Set: N:\CRF3\07192001\I877476.raw

66	Leu	Ile	His	Val	Pro	Pro	Arg	Lys	Thr	Phe	Ala	Ala	Ser	Arg	Glu	Glu	
67	145					150					155					160	
69	aca	gag	aag	gtt	atc	atc	ggt	gcg	ctc	gaa	aat	cta	ttc	gag	aac	acc	528
70	Thr	Glu	Lys	Val	Ile	Ile	Gly	Ala	Leu	Glu	Asn	Leu	Phe	Glu	Asn	Thr	
71					165					170					175		
73	aaa	gtt	aac	cct	aga	gag	att	ggt	ata	ctt	gtg	gtg	aac	tca	agc	atg	576
74	Lys	Val	Asn	Pro	Arg	Glu	Ile	Gly	Ile	Leu	Val	Val	Asn	Ser	Ser	Met	
75				180					185					190			
77	ttt	aat	cca	act	cct	tcg	cta	tcc	gct	atg	gtc	gtt	aat	act	ttc	aag	624
78	Phe	Asn	Pro	Thr	Pro	Ser	Leu	Ser	Ala	Met	Val	Val	Asn	Thr	Phe	Lys	
79		195					200						205				
81	ctc	cga	agc	aac	atc	aaa	agc	ttt	aat	cta	gga	gga	atg	ggt	tgt	agt	672
82	Leu	Arg	Ser	Asn	Ile	Lys	Ser	Phe	Asn	Leu	Gly	Gly	Met	Gly	Cys	Ser	
83		210					215				220						
85	gct	ggt	gtt	att	gcc	att	gat	ttg	gct	aaa	gac	ttg	ttg	cat	gtt	cat	720
86	Ala	Gly	Val	Ile	Ala	Ile	Asp	Leu	Ala	Lys	Asp	Leu	Leu	His	Val	His	
87	225				230				235						240		
89	aaa	aac	act	tat	gct	ctt	gtg	gtg	agc	act	gag	aac	atc	aca	caa	ggc	768
90	Lys	Asn	Thr	Tyr	Ala	Leu	Val	Val	Ser	Thr	Glu	Asn	Ile	Thr	Gln	Gly	
91				245					250					255			
93	att	tat	gct	gga	gaa	aat	aga	tca	atg	atg	gtt	agc	aat	tgc	ttg	ttt	816
94	Ile	Tyr	Ala	Gly	Glu	Asn	Arg	Ser	Met	Met	Val	Ser	Asn	Cys	Leu	Phe	
95			260					265					270				
97	cgt	gtt	ggt	ggg	gcc	gcg	att	ttg	ctc	tct	aac	aag	tcg	gga	gac	cgg	864
98	Arg	Val	Gly	Gly	Ala	Ala	Ile	Leu	Leu	Ser	Asn	Lys	Ser	Gly	Asp	Arg	
99		275					280					285					
101	aga	cgg	tcc	aag	tac	aag	cta	gtt	cac	acg	gtc	cga	acg	cat	act	gga	912
102	Arg	Arg	Ser	Lys	Tyr	Lys	Leu	Val	His	Thr	Val	Arg	Thr	His	Thr	Gly	
103		290					295					300					
105	gct	gat	gac	aag	tct	ttt	cga	tgt	gtg	caa	caa	gaa	gac	gat	gag	agc	960
106	Ala	Asp	Asp	Lys	Ser	Phe	Arg	Cys	Val	Gln	Gln	Glu	Asp	Asp	Glu	Ser	
107	305				310					315					320		
109	ggc	aaa	atc	gga	gtt	tgt	ctg	tca	aag	gac	ata	acc	aat	gtt	gcg	ggg	1008
110	Gly	Lys	Ile	Gly	Val	Cys	Leu	Ser	Lys	Asp	Ile	Thr	Asn	Val	Ala	Gly	
111				325					330					335			
113	aca	aca	ctt	acg	aaa	aat	ata	gca	aca	ttg	ggt	ccg	ttg	att	ctt	cct	1056
114	Thr	Thr	Leu	Thr	Lys	Asn	Ile	Ala	Thr	Leu	Gly	Pro	Leu	Ile	Leu	Pro	
115			340					345					350				
117	tta	agc	gaa	aag	ttt	ctt	ttt	ttc	gct	acc	ttc	gtc	gcc	aag	aaa	ctt	1104
118	Leu	Ser	Glu	Lys	Phe	Leu	Phe	Phe	Ala	Thr	Phe	Val	Ala	Lys	Lys	Leu	
119			355				360						365				
121	cta	aag	gat	aaa	atc	aag	cat	tac	tat	gtt	ccg	gat	ttc	aag	ctt	gct	1152
122	Leu	Lys	Asp	Lys	Ile	Lys	His	Tyr	Tyr	Val	Pro	Asp	Phe	Lys	Leu	Ala	
123		370					375					380					
125	gtt	gac	cat	ttc	tgt	att	cat	gcc	gga	ggc	aga	gcc	gtg	atc	gat	gag	1200
126	Val	Asp	His	Phe	Cys	Ile	His	Ala	Gly	Gly	Arg	Ala	Val	Ile	Asp	Glu	
127	385				390					395					400		
129	cta	gag	aag	aac	tta	gga	cta	tcg	ccg	atc	gat	gtg	gag	gca	tct	aga	1248
130	Leu	Glu	Lys	Asn	Leu	Gly	Leu	Ser	Pro	Ile	Asp	Val	Glu	Ala	Ser	Arg	

RAW SEQUENCE LISTING

DATE: 07/19/2001

PATENT APPLICATION: US/09/877,476

TIME: 12:52:07

Input Set : A:\PTO.txt

Output Set: N:\CRF3\07192001\I877476.raw

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131          405          410          415
133 tca acg tta cat aga ttt ggg aat act tca tct agc tca att tgg tat      1296
134 Ser Thr Leu His Arg Phe Gly Asn Thr Ser Ser Ser Ser Ile Trp Tyr
135          420          425          430
137 gaa tta gca tac ata gag gca aag gga aga atg aag aaa ggg aat aaa      1344
138 Glu Leu Ala Tyr Ile Glu Ala Lys Gly Arg Met Lys Lys Gly Asn Lys
139          435          440          445
141 gct tgg cag att gct tta gga tca ggg ttt aag tgt aat agt gcg gtt      1392
142 Ala Trp Gln Ile Ala Leu Gly Ser Gly Phe Lys Cys Asn Ser Ala Val
143          450          455          460
145 tgg gtg gct cta cgc aat gtc aag gca tcg gca aat agt cct tgg caa      1440
146 Trp Val Ala Leu Arg Asn Val Lys Ala Ser Ala Asn Ser Pro Trp Gln
147 465          470          475          480
149 cat tgc atc gat aga tat ccg gtt aaa att gat tct gat ttg tca aag      1488
150 His Cys Ile Asp Arg Tyr Pro Val Lys Ile Asp Ser Asp Leu Ser Lys
151          485          490          495
153 tca aag act cat gtc caa aac ggt cgg tcc taatttgatg tatctgagtg      1538
154 Ser Lys Thr His Val Gln Asn Gly Arg Ser
155          500          505
157 ccaacgttta ctttgtcttt cctttctttt attggttatg aattagatgt ttactaatgt      1598
158 tctctctctt ttcgttataa ataaagaagt tcaattcttc ctatagtttc aaacgcgatt      1658
159 ttaagcgttt ctatttaggt ttacatgaat ttctttttaca aaccatcttt t      1709
161 <210> SEQ ID NO: 2
162 <211> LENGTH: 506
163 <212> TYPE: PRT
164 <213> ORGANISM: Arabidopsis thaliana
166 <400> SEQUENCE: 2
167 Met Thr Ser Val Asn Val Lys Leu Leu Tyr Arg Tyr Val Leu Thr Asn
168 1          5          10          15
169 Phe Phe Asn Leu Cys Leu Phe Pro Leu Thr Ala Phe Leu Ala Gly Lys
170          20          25          30
171 Ala Ser Arg Leu Thr Ile Asn Asp Leu His Asn Phe Leu Ser Tyr Leu
172          35          40          45
173 Gln His Asn Leu Ile Thr Val Thr Leu Leu Phe Ala Phe Thr Val Phe
174          50          55          60
175 Gly Leu Val Leu Tyr Ile Val Thr Arg Pro Asn Pro Val Tyr Leu Val
176 65          70          75          80
177 Asp Tyr Ser Cys Tyr Leu Pro Pro Pro His Leu Lys Val Ser Val Ser
178          85          90          95
179 Lys Val Met Asp Ile Phe Tyr Gln Ile Arg Lys Ala Asp Thr Ser Ser
180          100          105          110
181 Arg Asn Val Ala Cys Asp Asp Pro Ser Ser Leu Asp Phe Leu Arg Lys
182          115          120          125
183 Ile Gln Glu Arg Ser Gly Leu Gly Asp Glu Thr Tyr Ser Pro Glu Gly
184          130          135          140
185 Leu Ile His Val Pro Pro Arg Lys Thr Phe Ala Ala Ser Arg Glu Glu
186 145          150          155          160
187 Thr Glu Lys Val Ile Ile Gly Ala Leu Glu Asn Leu Phe Glu Asn Thr
188          165          170          175

```

RAW SEQUENCE LISTING

DATE: 07/19/2001

PATENT APPLICATION: US/09/877,476

TIME: 12:52:08

Input Set : A:\PTO.txt

Output Set: N:\CRF3\07192001\I877476.raw

```

189 Lys Val Asn Pro Arg Glu Ile Gly Ile Leu Val Val Asn Ser Ser Met
190                               180                               185                               190
191 Phe Asn Pro Thr Pro Ser Leu Ser Ala Met Val Val Asn Thr Phe Lys
192                               195                               200                               205
193 Leu Arg Ser Asn Ile Lys Ser Phe Asn Leu Gly Gly Met Gly Cys Ser
194                               210                               215                               220
195 Ala Gly Val Ile Ala Ile Asp Leu Ala Lys Asp Leu Leu His Val His
196 225                               230                               235                               240
197 Lys Asn Thr Tyr Ala Leu Val Val Ser Thr Glu Asn Ile Thr Gln Gly
198                               245                               250                               255
199 Ile Tyr Ala Gly Glu Asn Arg Ser Met Met Val Ser Asn Cys Leu Phe
200                               260                               265                               270
201 Arg Val Gly Gly Ala Ala Ile Leu Leu Ser Asn Lys Ser Gly Asp Arg
202                               275                               280                               285
203 Arg Arg Ser Lys Tyr Lys Leu Val His Thr Val Arg Thr His Thr Gly
204                               290                               295                               300
205 Ala Asp Asp Lys Ser Phe Arg Cys Val Gln Gln Glu Asp Asp Glu Ser
206 305                               310                               315                               320
207 Gly Lys Ile Gly Val Cys Leu Ser Lys Asp Ile Thr Asn Val Ala Gly
208                               325                               330                               335
209 Thr Thr Leu Thr Lys Asn Ile Ala Thr Leu Gly Pro Leu Ile Leu Pro
210                               340                               345                               350
211 Leu Ser Glu Lys Phe Leu Phe Phe Ala Thr Phe Val Ala Lys Lys Leu
212                               355                               360                               365
213 Leu Lys Asp Lys Ile Lys His Tyr Tyr Val Pro Asp Phe Lys Leu Ala
214                               370                               375                               380
215 Val Asp His Phe Cys Ile His Ala Gly Gly Arg Ala Val Ile Asp Glu
216 385                               390                               395                               400
217 Leu Glu Lys Asn Leu Gly Leu Ser Pro Ile Asp Val Glu Ala Ser Arg
218                               405                               410                               415
219 Ser Thr Leu His Arg Phe Gly Asn Thr Ser Ser Ser Ser Ile Trp Tyr
220                               420                               425                               430
221 Glu Leu Ala Tyr Ile Glu Ala Lys Gly Arg Met Lys Lys Gly Asn Lys
222                               435                               440                               445
223 Ala Trp Gln Ile Ala Leu Gly Ser Gly Phe Lys Cys Asn Ser Ala Val
224                               450                               455                               460
225 Trp Val Ala Leu Arg Asn Val Lys Ala Ser Ala Asn Ser Pro Trp Gln
226 465                               470                               475                               480
227 His Cys Ile Asp Arg Tyr Pro Val Lys Ile Asp Ser Asp Leu Ser Lys
228                               485                               490                               495
229 Ser Lys Thr His Val Gln Asn Gly Arg Ser
230                               500                               505
232 <210> SEQ ID NO: 3
233 <211> LENGTH: 1524
234 <212> TYPE: DNA
235 <213> ORGANISM: Brassica napus
237 <220> FEATURE:
238 <221> NAME/KEY: CDS
239 <222> LOCATION: (1)...(1521)

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RAW SEQUENCE LISTING

DATE: 07/19/2001

PATENT APPLICATION: US/09/877,476

TIME: 12:52:08

Input Set : A:\PTO.txt

Output Set: N:\CRF3\07192001\I877476.raw

```

241 <400> SEQUENCE: 3
242 atg acg tcc att aac gta aag ctc ctt tac cat tac gtc ata acc aac      48
243 Met Thr Ser Ile Asn Val Lys Leu Leu Tyr His Tyr Val Ile Thr Asn
244 1 5 10 15
246 ctt ttc aac ctt tgc ttc ttt ccg tta acg gcg atc gtc gcc gga aaa      96
247 Leu Phe Asn Leu Cys Phe Phe Pro Leu Thr Ala Ile Val Ala Gly Lys
248 20 25 30
250 gcc tat cgg ctt acc ata gac gat ctt cac cac tta tac tat tcc tat     144
251 Ala Tyr Arg Leu Thr Ile Asp Asp Leu His His Leu Tyr Tyr Ser Tyr
252 35 40 45
254 ctc caa cac aac ctc ata acc atc gct cca ctc ttt gcc ttc acc gtt     192
255 Leu Gln His Asn Leu Ile Thr Ile Ala Pro Leu Phe Ala Phe Thr Val
256 50 55 60
258 ttc ggt tcg gtt ctc tac atc gca acc cgg ccc aaa ccg gtt tac ctc     240
259 Phe Gly Ser Val Leu Tyr Ile Ala Thr Arg Pro Lys Pro Val Tyr Leu
260 65 70 75 80
262 gtt gag tac tca tgc tac ctt cca cca acg cat tgt aga tca agt atc     288
263 Val Glu Tyr Ser Cys Tyr Leu Pro Pro Thr His Cys Arg Ser Ser Ile
264 85 90 95
266 tcc aag gtc atg gat atc ttt tat caa gta aga aaa gct gat cct tct     336
267 Ser Lys Val Met Asp Ile Phe Tyr Gln Val Arg Lys Ala Asp Pro Ser
268 100 105 110
270 cgg aac ggc acg tgc gat gac tcg tcg tgg ctt gac ttc ttg agg aag     384
271 Arg Asn Gly Thr Cys Asp Asp Ser Ser Trp Leu Asp Phe Leu Arg Lys
272 115 120 125
274 att caa gaa cgt tca ggt cta ggc gat gaa act cac ggg ccc gag ggg     432
275 Ile Gln Glu Arg Ser Gly Leu Gly Asp Glu Thr His Gly Pro Glu Gly
276 130 135 140
278 ctg ctt cag gtc cct ccc cgg aag act ttt gcg gcg gcg cgt gaa gag     480
279 Leu Leu Gln Val Pro Pro Arg Lys Thr Phe Ala Ala Ala Arg Glu Glu
280 145 150 155 160
282 acg gag caa gtt atc att ggt gcg cta gaa aat cta ttc aag aac acc     528
283 Thr Glu Gln Val Ile Ile Gly Ala Leu Glu Asn Leu Phe Lys Asn Thr
284 165 170 175
286 aac gtt aac cct aaa gat ata ggt ata ctt gtg gtg aac tca agc atg     576
287 Asn Val Asn Pro Lys Asp Ile Gly Ile Leu Val Val Asn Ser Ser Met
288 180 185 190
290 ttt aat cca act cca tcg ctc tcc gcg atg gtc gtt aac act ttc aag     624
291 Phe Asn Pro Thr Pro Ser Leu Ser Ala Met Val Val Asn Thr Phe Lys
292 195 200 205
294 ctc cga agc aac gta aga agc ttt aac ctt ggt ggc atg ggt tgt agt     672
295 Leu Arg Ser Asn Val Arg Ser Phe Asn Leu Gly Gly Met Gly Cys Ser
296 210 215 220
298 gcc ggc gtt ata gcc att gat cta gca aag gac ttg ttg cat gtc cat     720
299 Ala Gly Val Ile Ala Ile Asp Leu Ala Lys Asp Leu Leu His Val His
300 225 230 235 240
302 aaa aat acg tat gct ctt gtg gtg agc aca gag aac atc act tat aac     768
303 Lys Asn Thr Tyr Ala Leu Val Val Ser Thr Glu Asn Ile Thr Tyr Asn
304 245 250 255

```

Use of n and/or Xaa has been detected in the Sequence Listing.
 Review the Sequence Listing to insure a corresponding
 explanation is presented in the <220> to <223> fields of
 each sequence using n or Xaa.

VERIFICATION SUMMARY

PATENT APPLICATION: US/09/877,476

DATE: 07/19/2001

TIME: 12:52:09

Input Set : A:\PTO.txt

Output Set: N:\CRF3\07192001\I877476.raw

L:12 M:270 C: Current Application Number differs, Replaced Current Application No
L:12 M:271 C: Current Filing Date differs, Replaced Current Filing Date
L:779 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:7
L:868 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:8
L:2782 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:25
L:2863 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:26
L:3224 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:29
L:3305 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:30

OIPE

RAW SEQUENCE LISTING

DATE: 06/27/2001

PATENT APPLICATION: US/09/877,476

TIME: 18:39:57

Input Set : A:\07148-108001.TXT

Output Set: N:\CRF3\06272001\I877476.raw

Does Not Comply
Corrected Diskette Needed

```

4 <110> APPLICANT: Jaworski, Jan G.
5   Blacklock, Brenda J.
7 <120> TITLE OF INVENTION: FATTY ACID ELONGASE 3-KETOACYL COA
8   SYNTHASE POLYPEPTIDES
10 <130> FILE REFERENCE: 07148-108001
C--> 12 <140> CURRENT APPLICATION NUMBER: US/09/877,476
C--> 12 <141> CURRENT FILING DATE: 2001-06-08
12 <150> PRIOR APPLICATION NUMBER: US 60/210,326
13 <151> PRIOR FILING DATE: 2000-06-08
15 <160> NUMBER OF SEQ ID NOS: 56
17 <170> SOFTWARE: FastSEQ for Windows Version 4.0
19 <210> SEQ ID NO: 1
20 <211> LENGTH: 1709
21 <212> TYPE: DNA
22 <213> ORGANISM: Arabidopsis thaliana
24 <220> FEATURE:
25 <221> NAME/KEY: CDS
26 <222> LOCATION: (1)...(1518)
28 <400> SEQUENCE: 1
29 atg acg tcc gtt aac gtt aag ctc ctt tac cgt tac gtc tta acc aac      48
30 Met Thr Ser Val Asn Val Lys Leu Leu Tyr Arg Tyr Val Leu Thr Asn
31 1      5      10      15
33 ttt ttc aac ctc tgt ttg ttc ccg tta acg gcg ttc ctc gcc gga aaa      96
34 Phe Phe Asn Leu Cys Leu Phe Pro Leu Thr Ala Phe Leu Ala Gly Lys
35      20      25      30
37 gcc tct cgg ctt acc ata aac gat ctc cac aac ttc ctt tcc tat ctc      144
38 Ala Ser Arg Leu Thr Ile Asn Asp Leu His Asn Phe Leu Ser Tyr Leu
39      35      40      45
41 caa cac aac ctt ata aca gta act tta ctc ttt gct ttc act gtt ttc      192
42 Gln His Asn Leu Ile Thr Val Thr Leu Leu Phe Ala Phe Thr Val Phe
43      50      55      60
45 ggt ttg gtt ctc tac atc gta acc cga ccc aat ccg gtt tat ctc gtt      240
46 Gly Leu Val Leu Tyr Ile Val Thr Arg Pro Asn Pro Val Tyr Leu Val
47      65      70      75      80
49 gac tac tcg tgt tac ctt cca cca ccg cat ctc aaa gtt agt gtc tct      288
50 Asp Tyr Ser Cys Tyr Leu Pro Pro Pro His Leu Lys Val Ser Val Ser
51      85      90      95
53 aaa gtc atg gat att ttc tac caa ata aga aaa gct gat act tct tca      336
54 Lys Val Met Asp Ile Phe Tyr Gln Ile Arg Lys Ala Asp Thr Ser Ser
55      100      105      110
57 cgg aac gtg gca tgt gat gat ccg tcc tcg ctc gat ttc ctg agg aag      384
58 Arg Asn Val Ala Cys Asp Asp Pro Ser Ser Leu Asp Phe Leu Arg Lys
59      115      120      125
61 att caa gag cgt tca ggt cta ggt gat gag acg tac agt cct gag gga      432
62 Ile Gln Glu Arg Ser Gly Leu Gly Asp Glu Thr Tyr Ser Pro Glu Gly
63      130      135      140
65 ctc att cac gta cca ccg cgg aag act ttt gca gcg tca cgt gaa gag      480

```


RAW SEQUENCE LISTING

DATE: 06/27/2001

PATENT APPLICATION: US/09/877,476

TIME: 18:39:57

Input Set : A:\07148-108001.TXT

Output Set: N:\CRF3\06272001\I877476.raw

```

66 Leu Ile His Val Pro Pro Arg Lys Thr Phe Ala Ala Ser Arg Glu Glu
67 145 150 155 160
69 aca gag aag gtt atc atc ggt gcg ctc gaa aat cta ttc gag aac acc 528
70 Thr Glu Lys Val Ile Ile Gly Ala Leu Glu Asn Leu Phe Glu Asn Thr
71 165 170 175
73 aaa gtt aac cct aga gag att ggt ata ctt gtg gtg aac tca agc atg 576
74 Lys Val Asn Pro Arg Glu Ile Gly Ile Leu Val Val Asn Ser Ser Met
75 180 185 190
77 ttt aat cca act cct tcg cta tcc gct atg gtc gtt aat act ttc aag 624
78 Phe Asn Pro Thr Pro Ser Leu Ser Ala Met Val Val Asn Thr Phe Lys
79 195 200 205
81 ctc cga agc aac atc aaa agc ttt aat cta gga gga atg ggt tgt agt 672
82 Leu Arg Ser Asn Ile Lys Ser Phe Asn Leu Gly Gly Met Gly Cys Ser
83 210 215 220
85 gct ggt gtt att gcc att gat ttg gct aaa gac ttg ttg cat gtt cat 720
86 Ala Gly Val Ile Ala Ile Asp Leu Ala Lys Asp Leu Leu His Val His
87 225 230 235 240
89 aaa aac act tat gct ctt gtg gtg agc act gag aac atc aca caa ggc 768
90 Lys Asn Thr Tyr Ala Leu Val Val Ser Thr Glu Asn Ile Thr Gln Gly
91 245 250 255
93 att tat gct gga gaa aat aga tca atg atg gtt agc aat tgc ttg ttt 816
94 Ile Tyr Ala Gly Glu Asn Arg Ser Met Met Val Ser Asn Cys Leu Phe
95 260 265 270
97 cgt gtt ggt ggg gcc gcg att ttg ctc tct aac aag tcg gga gac cgg 864
98 Arg Val Gly Gly Ala Ala Ile Leu Leu Ser Asn Lys Ser Gly Asp Arg
99 275 280 285
101 aga cgg tcc aag tac aag cta gtt cac acg gtc cga acg cat act gga 912
102 Arg Arg Ser Lys Tyr Lys Leu Val His Thr Val Arg Thr His Thr Gly
103 290 295 300
105 gct gat gac aag tct ttt cga tgt gtg caa caa gaa gac gat gag agc 960
106 Ala Asp Asp Lys Ser Phe Arg Cys Val Gln Gln Glu Asp Asp Glu Ser
107 305 310 315 320
109 ggc aaa atc gga gtt tgt ctg tca aag gac ata acc aat gtt gcg ggg 1008
110 Gly Lys Ile Gly Val Cys Leu Ser Lys Asp Ile Thr Asn Val Ala Gly
111 325 330 335
113 aca aca ctt acg aaa aat ata gca aca ttg ggt ccg ttg att ctt cct 1056
114 Thr Thr Leu Thr Lys Asn Ile Ala Thr Leu Gly Pro Leu Ile Leu Pro
115 340 345 350
117 tta agc gaa aag ttt ctt ttt ttc gct acc ttc gtc gcc aag aaa ctt 1104
118 Leu Ser Glu Lys Phe Leu Phe Phe Ala Thr Phe Val Ala Lys Lys Leu
119 355 360 365
121 cta aag gat aaa atc aag cat tac tat gtt ccg gat ttc aag ctt gct 1152
122 Leu Lys Asp Lys Ile Lys His Tyr Tyr Val Pro Asp Phe Lys Leu Ala
123 370 375 380
125 gtt gac cat ttc tgt att cat gcc gga ggc aga gcc gtg atc gat gag 1200
126 Val Asp His Phe Cys Ile His Ala Gly Gly Arg Ala Val Ile Asp Glu
127 385 390 395 400
129 cta gag aag aac tta gga cta tcg ccg atc gat gtg gag gca tct aga 1248
130 Leu Glu Lys Asn Leu Gly Leu Ser Pro Ile Asp Val Glu Ala Ser Arg

```

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```

131          405          410          415
133 tca acg tta cat aga ttt ggg aat act tca tct agc tca att tgg tat      1296
134 Ser Thr Leu His Arg Phe Gly Asn Thr Ser Ser Ser Ser Ile Trp Tyr
135          420          425          430
137 gaa tta gca tac ata gag gca aag gga aga atg aag aaa ggg aat aaa      1344
138 Glu Leu Ala Tyr Ile Glu Ala Lys Gly Arg Met Lys Lys Gly Asn Lys
139          435          440          445
141 gct tgg cag att gct tta gga tca ggg ttt aag tgt aat agt gcg gtt      1392
142 Ala Trp Gln Ile Ala Leu Gly Ser Gly Phe Lys Cys Asn Ser Ala Val
143          450          455          460
145 tgg gtg gct cta cgc aat gtc aag gca tcg gca aat agt cct tgg caa      1440
146 Trp Val Ala Leu Arg Asn Val Lys Ala Ser Ala Asn Ser Pro Trp Gln
147 465          470          475          480
149 cat tgc atc gat aga tat ccg gtt aaa att gat tct gat ttg tca aag      1488
150 His Cys Ile Asp Arg Tyr Pro Val Lys Ile Asp Ser Asp Leu Ser Lys
151          485          490          495
153 tca aag act cat gtc caa aac ggt cgg tcc taatttgatg tatctgagtg      1538
154 Ser Lys Thr His Val Gln Asn Gly Arg Ser
155          500          505
157 ccaacgttta ctttgtcttt cctttctttt attggttatg aattagatgt ttactaatgt      1598
158 tcctctcttt ttctgtataa ataaagaagt tcaattcttc ctatagtttc aaacgcgatt      1658
159 ttaagcgttt ctatttaggt ttacatgaat ttcttttaca aaccatcttt t      1709
161 <210> SEQ ID NO: 2
162 <211> LENGTH: 506
163 <212> TYPE: PRT
164 <213> ORGANISM: Arabidopsis thaliana
166 <400> SEQUENCE: 2
167 Met Thr Ser Val Asn Val Lys Leu Leu Tyr Arg Tyr Val Leu Thr Asn
168 1          5          10          15
169 Phe Phe Asn Leu Cys Leu Phe Pro Leu Thr Ala Phe Leu Ala Gly Lys
170          20          25          30
171 Ala Ser Arg Leu Thr Ile Asn Asp Leu His Asn Phe Leu Ser Tyr Leu
172          35          40          45
173 Gln His Asn Leu Ile Thr Val Thr Leu Leu Phe Ala Phe Thr Val Phe
174          50          55          60
175 Gly Leu Val Leu Tyr Ile Val Thr Arg Pro Asn Pro Val Tyr Leu Val
176 65          70          75          80
177 Asp Tyr Ser Cys Tyr Leu Pro Pro Pro His Leu Lys Val Ser Val Ser
178          85          90          95
179 Lys Val Met Asp Ile Phe Tyr Gln Ile Arg Lys Ala Asp Thr Ser Ser
180          100          105          110
181 Arg Asn Val Ala Cys Asp Asp Pro Ser Ser Leu Asp Phe Leu Arg Lys
182          115          120          125
183 Ile Gln Glu Arg Ser Gly Leu Gly Asp Glu Thr Tyr Ser Pro Glu Gly
184          130          135          140
185 Leu Ile His Val Pro Pro Arg Lys Thr Phe Ala Ala Ser Arg Glu Glu
186 145          150          155          160
187 Thr Glu Lys Val Ile Ile Gly Ala Leu Glu Asn Leu Phe Glu Asn Thr
188          165          170          175

```

RAW SEQUENCE LISTING

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DATE: 06/27/2001

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Input Set : A:\07148-108001.TXT

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```

189 Lys Val Asn Pro Arg Glu Ile Gly Ile Leu Val Val Asn Ser Ser Met
190      180      185      190
191 Phe Asn Pro Thr Pro Ser Leu Ser Ala Met Val Val Asn Thr Phe Lys
192      195      200      205
193 Leu Arg Ser Asn Ile Lys Ser Phe Asn Leu Gly Gly Met Gly Cys Ser
194      210      215      220
195 Ala Gly Val Ile Ala Ile Asp Leu Ala Lys Asp Leu Leu His Val His
196 225      230      235      240
197 Lys Asn Thr Tyr Ala Leu Val Val Ser Thr Glu Asn Ile Thr Gln Gly
198      245      250      255
199 Ile Tyr Ala Gly Glu Asn Arg Ser Met Met Val Ser Asn Cys Leu Phe
200      260      265      270
201 Arg Val Gly Gly Ala Ala Ile Leu Leu Ser Asn Lys Ser Gly Asp Arg
202      275      280      285
203 Arg Arg Ser Lys Tyr Lys Leu Val His Thr Val Arg Thr His Thr Gly
204      290      295      300
205 Ala Asp Asp Lys Ser Phe Arg Cys Val Gln Gln Glu Asp Asp Glu Ser
206 305      310      315      320
207 Gly Lys Ile Gly Val Cys Leu Ser Lys Asp Ile Thr Asn Val Ala Gly
208      325      330      335
209 Thr Thr Leu Thr Lys Asn Ile Ala Thr Leu Gly Pro Leu Ile Leu Pro
210      340      345      350
211 Leu Ser Glu Lys Phe Leu Phe Phe Ala Thr Phe Val Ala Lys Lys Leu
212      355      360      365
213 Leu Lys Asp Lys Ile Lys His Tyr Tyr Val Pro Asp Phe Lys Leu Ala
214      370      375      380
215 Val Asp His Phe Cys Ile His Ala Gly Gly Arg Ala Val Ile Asp Glu
216 385      390      395      400
217 Leu Glu Lys Asn Leu Gly Leu Ser Pro Ile Asp Val Glu Ala Ser Arg
218      405      410      415
219 Ser Thr Leu His Arg Phe Gly Asn Thr Ser Ser Ser Ser Ile Trp Tyr
220      420      425      430
221 Glu Leu Ala Tyr Ile Glu Ala Lys Gly Arg Met Lys Lys Gly Asn Lys
222      435      440      445
223 Ala Trp Gln Ile Ala Leu Gly Ser Gly Phe Lys Cys Asn Ser Ala Val
224      450      455      460
225 Trp Val Ala Leu Arg Asn Val Lys Ala Ser Ala Asn Ser Pro Trp Gln
226 465      470      475      480
227 His Cys Ile Asp Arg Tyr Pro Val Lys Ile Asp Ser Asp Leu Ser Lys
228      485      490      495
229 Ser Lys Thr His Val Gln Asn Gly Arg Ser
230      500      505
232 <210> SEQ ID NO: 3
233 <211> LENGTH: 1524
234 <212> TYPE: DNA
235 <213> ORGANISM: Brassica napus
237 <220> FEATURE:
238 <221> NAME/KEY: CDS
239 <222> LOCATION: (1)...(1521)

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RAW SEQUENCE LISTING

DATE: 06/27/2001

PATENT APPLICATION: US/09/877,476

TIME: 18:39:57

Input Set : A:\07148-108001.TXT

Output Set: N:\CRF3\06272001\I877476.raw

```

241 <400> SEQUENCE: 3
242 atg acg tcc att aac gta aag ctc ctt tac cat tac gtc ata acc aac      48
243 Met Thr Ser Ile Asn Val Lys Leu Leu Tyr His Tyr Val Ile Thr Asn
244 1 5 10 15
246 ctt ttc aac ctt tgc ttc ttt ccg tta acg gcg atc gtc gcc gga aaa      96
247 Leu Phe Asn Leu Cys Phe Phe Pro Leu Thr Ala Ile Val Ala Gly Lys
248 20 25 30
250 gcc tat cgg ctt acc ata gac gat ctt cac cac tta tac tat tcc tat      144
251 Ala Tyr Arg Leu Thr Ile Asp Asp Leu His His Leu Tyr Tyr Ser Tyr
252 35 40 45
254 ctc caa cac aac ctc ata acc atc gct cca ctc ttt gcc ttc acc gtt      192
255 Leu Gln His Asn Leu Ile Thr Ile Ala Pro Leu Phe Ala Phe Thr Val
256 50 55 60
258 ttc ggt tcg gtt ctc tac atc gca acc cgg ccc aaa ccg gtt tac ctc      240
259 Phe Gly Ser Val Leu Tyr Ile Ala Thr Arg Pro Lys Pro Val Tyr Leu
260 65 70 75 80
262 gtt gag tac tca tgc tac ott cca cca acg cat tgt aga tca agt atc      288
263 Val Glu Tyr Ser Cys Tyr Leu Pro Pro Thr His Cys Arg Ser Ser Ile
264 85 90 95
266 tcc aag gtc atg gat atc ttt tat caa gta aga aaa gct gat cct tct      336
267 Ser Lys Val Met Asp Ile Phe Tyr Gln Val Arg Lys Ala Asp Pro Ser
268 100 105 110
270 cgg aac ggc acg tgc gat gac tcg tcg tgg ctt gac ttc ttg agg aag      384
271 Arg Asn Gly Thr Cys Asp Asp Ser Ser Trp Leu Asp Phe Leu Arg Lys
272 115 120 125
274 att caa gaa cgt tca ggt cta ggc gat gaa act cac ggg ccc gag ggg      432
275 Ile Gln Glu Arg Ser Gly Leu Gly Asp Glu Thr His Gly Pro Glu Gly
276 130 135 140
278 ctg ctt cag gtc cct ccc cgg aag act ttt gcg gcg gcg cgt gaa gag      480
279 Leu Leu Gln Val Pro Pro Arg Lys Thr Phe Ala Ala Ala Arg Glu Glu
280 145 150 155 160
282 acg gag caa gtt atc att ggt gcg cta gaa aat cta ttc aag aac acc      528
283 Thr Glu Gln Val Ile Ile Gly Ala Leu Glu Asn Leu Phe Lys Asn Thr
284 165 170 175
286 aac gtt aac cct aaa gat ata ggt ata ctt gtg gtg aac tca agc atg      576
287 Asn Val Asn Pro Lys Asp Ile Gly Ile Leu Val Val Asn Ser Ser Met
288 180 185 190
290 ttt aat cca act cca tcg ctc tcc gcg atg gtc gtt aac act ttc aag      624
291 Phe Asn Pro Thr Pro Ser Leu Ser Ala Met Val Val Asn Thr Phe Lys
292 195 200 205
294 ctc cga agc aac gta aga agc ttt aac ctt ggt ggc atg ggt tgt agt      672
295 Leu Arg Ser Asn Val Arg Ser Phe Asn Leu Gly Gly Met Gly Cys Ser
296 210 215 220
298 gcc ggc gtt ata gcc att gat cta gca aag gac ttg ttg cat gtc cat      720
299 Ala Gly Val Ile Ala Ile Asp Leu Ala Lys Asp Leu Leu His Val His
300 225 230 235 240
302 aaa aat acg tat gct ctt gtg gtg agc aca gag aac atc act tat aac      768
303 Lys Asn Thr Tyr Ala Leu Val Val Ser Thr Glu Asn Ile Thr Tyr Asn
304 245 250 255

```

VERIFICATION SUMMARY

PATENT APPLICATION: US/09/877,476

DATE: 06/27/2001

TIME: 18:39:58

Input Set : A:\07148-108001.TXT

Output Set: N:\CRF3\06272001\I877476.raw

L:12 M:270 C: Current Application Number differs, Replaced Current Application No
L:12 M:271 C: Current Filing Date differs, Replaced Current Filing Date
L:779 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:7
L:868 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:8
L:1992 M:259 W: Allowed number of lines exceeded, <223> Other Information:
L:2137 M:259 W: Allowed number of lines exceeded, <223> Other Information:
L:2359 M:259 W: Allowed number of lines exceeded, <223> Other Information:
L:2785 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:25
L:2866 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:26
L:3227 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:29
L:3308 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:30